



# DCP Signal Output Adapter 2.0

## Quick Start Guide



**Delivering quality data where and when you need it most.**

### Introduction:

The 599820 is a communication adapter for the EXO multiparameter sonde platform. It converts the proprietary signal from the water quality sonde into either SDI-12 or RS-232 signals. The adapter simplifies integration into 3rd party DCP systems, and also features a USB port that supports passthrough communication directly to the connected sonde. This feature allows configuration, calibration, and data transfer without having to disconnect the field cabling.



### Adapter Overview:

**Supply Power, 12VDC**  
Provided from external regulated power source (not included).

**SDI-12 & RS-232 I/O Terminal**  
Use either SDI-12 or RS-232 terminals.



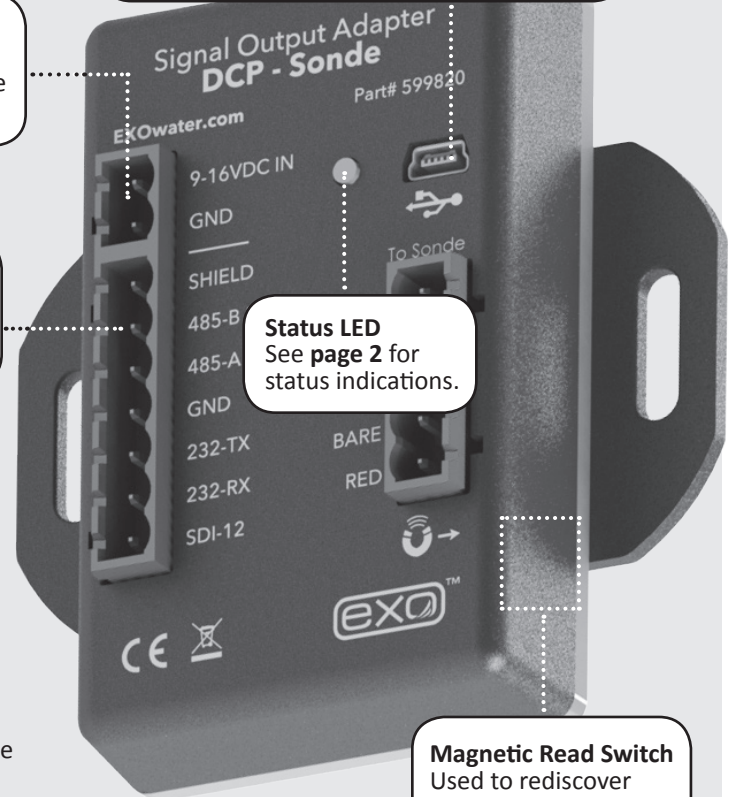
### Safety:

Refer to EXO system manual for complete safety documentation associated with the EXO system. (Available at [EXOWater.com](http://EXOWater.com))

Follow all applicable code and regulations subject to electrical wiring and operation of the system.

### Mini USB Connector

Provide power to the adapter, and passthrough communication to the attached sonde. See **page 4** for USB passthrough info.



**Status LED**  
See **page 2** for status indications.

**Magnetic Read Switch**  
Used to rediscover attached sonde.

### Specifications

**Supply Voltage:** 9 - 16 VDC or USB 5 VDC

**Current Draw Adapter:**  
~20mA typical (@12VDC)

**Current Draw Sonde:** ~sleep 0.25mA reading and 100mA during operation

**Max Net Current Draw for Systems:**  
~200mAmps (@12VDC)

**Dimensions:** L=3.5", W=3.5", H=1.5"  
(89cm x 89cm x 38cm)

**Operating Temp:** -40°C to +60°C

**Storage Temp:** -50°C to +80°C

**Humidity:** 0 to 99% non-condensing



### What's Included:

Your new 599820 EXO Communication Adapter comes with:

- (1) DCP 2.0 Adapter
- (3) green wiring terminal blocks (Sonde 5-pin, Power 2-pin, DCP 7-pin)
- (1) Panel mounting bracket
- (1) Hook and loop fastener

If any item is missing, please contact [info@ysi.com](mailto:info@ysi.com) for replacements.



### You'll also need:

- Flat blade screwdriver for terminal blocks
- Phillip's screwdriver for panel mount bracket
- EXO magnetic sensor tool (optional)
- EXO Flying Lead Field cable (599008-x)
- EXO sonde system, sensors, and associated hardware
- Latest KOR software (available from [EXOWater.com](http://EXOWater.com)) (KOR 2.0 available Q1 of 2016)



## ➤ Getting Started

### Mounting:

The adapter should be protected from the elements, and it is recommended it be mounted inside of a sealed enclosure with desiccant to prevent condensation.

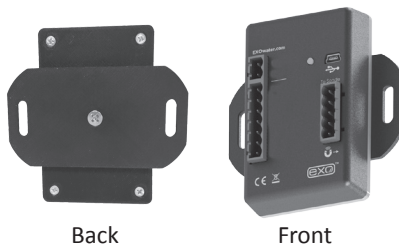
The adapter includes a panel mount in addition to self-adhesive hook and loop fastener. Either of these two methods can be used to securely mount the adapter. Use the provided Phillips screw to secure the panel mount:

#### Panel Mount

1:



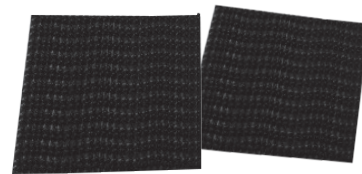
2:



Back

Front

#### Self-Adhesive Hook and Loop Fastener



**Note:** If using self adhesive hook and loop, clean and dry both surfaces before applying.

### Status LED Indications

Off	No power
On	No Sonde connected
Flashing at 1 Hz	Sonde connected, everything normal
Flashing at 1/10 Hz	Low power sleep (Will flash on for 1 second when magnetic switch is activated.)

## ➤ Wiring

Have the following ready:

- EXO Sonde
- DCP 2.0 Adapter
- Flying Lead Cable
- Desiccant if using Vented Cable
- Flat blade screwdriver
- Power & Data Logger Wires



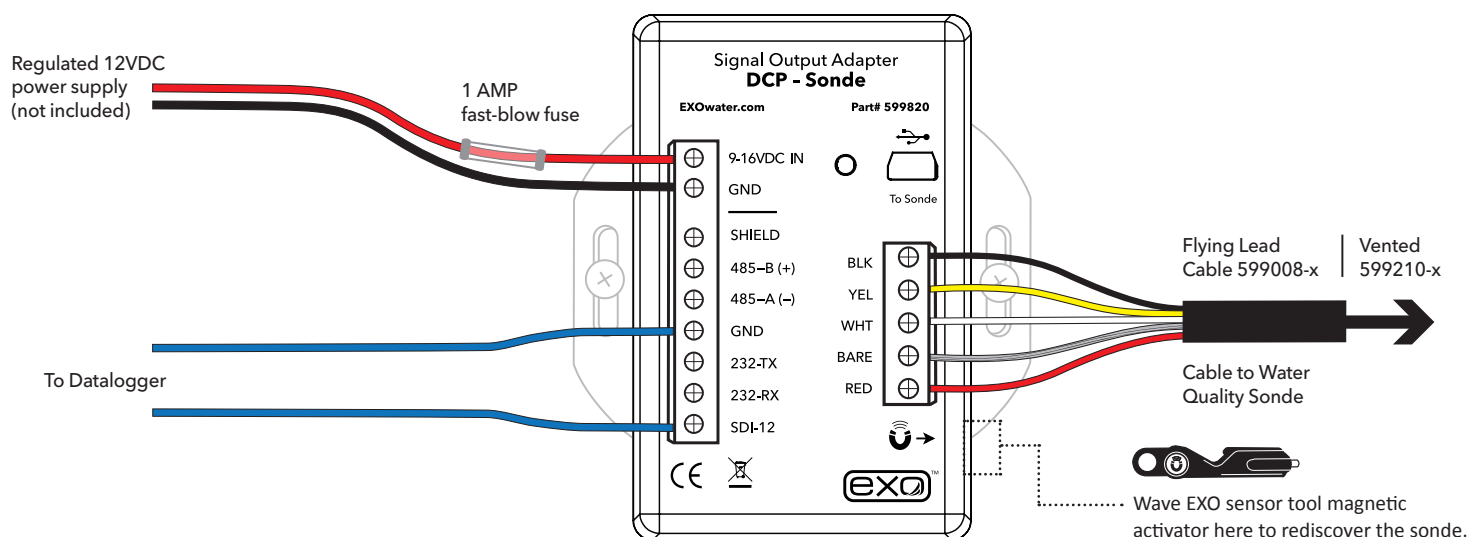
See next page for wiring diagrams.



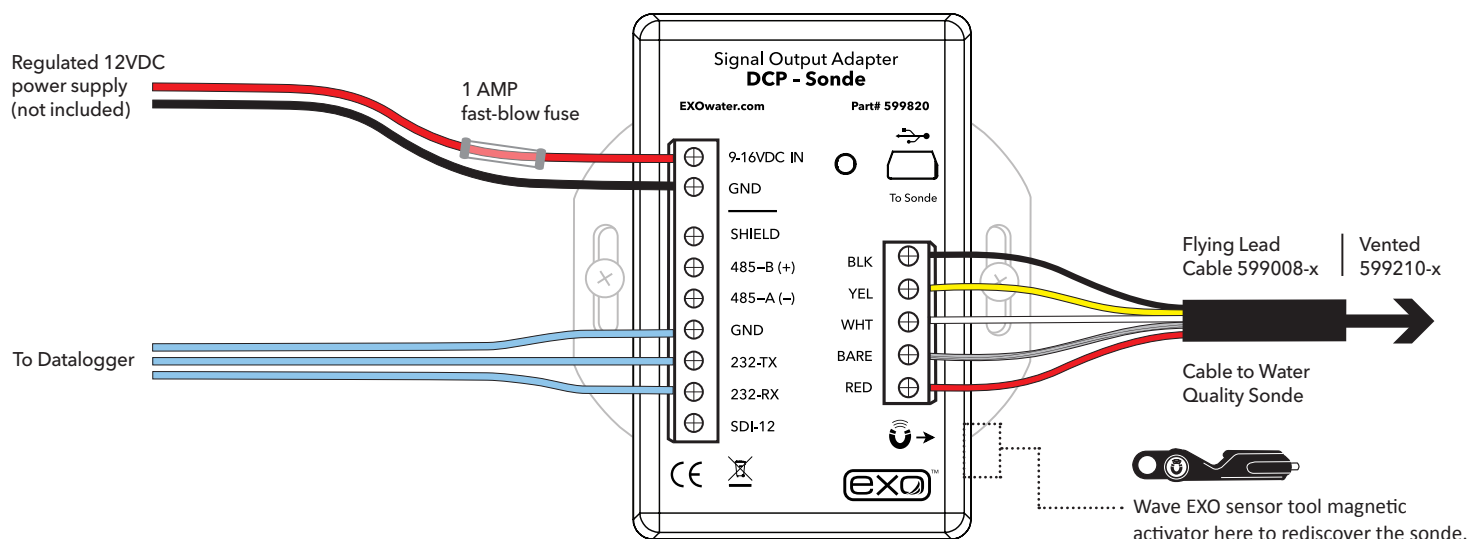
**Webinar | A Simple Guide to Collecting Water Quality Data**  
Learn the basics of wiring your Sonde up to a DCP:  
<https://goo.gl/B4PPK7>

## ➤ Wiring Continued

Next wire the flying lead cable, power, and DCP ports as labeled in one of the following configurations:



OR



When connecting new sondes to the DCP adapter, it may be necessary to redetect the sonde. This can be done by power cycling the adapter or by using the magnetic read switch at the lower right hand side of the enclosure. Waving the magnet in the EXO sensor tool, over the area referenced by the square above, will force a network redetect where all new sensors and configurations will be discovered.

**Note:** The orange wire on the flying lead cable to the sonde will not be used. It can be taped back during installation.



## ➤ USB Passthrough Mode

The 599820 DCP Signal Output Adapter can function in a similar fashion as the 599810 USB communication adapter. After the Signal Output Adapter is wired as shown in the previous configuration, connecting to the USB port on the adapter will allow direct communications with the sonde using KorEXO software. **USB passthrough drivers** will automatically be installed along with KOR 2.0 software, they are also available separately from the [EXOWater.com](http://EXOWater.com) website. Install these drivers on your PC to communicate with a signal output adapter (SOA) through any version of Desktop KOR:



**Note:** USB utilizes Communication Device Class (CDC) and installs as com port on PC: "YSI SOA/DCP Gen2". The USB connection may also be used to update firmware on the adapter using KOR software.

## ➤ Output Configuration

In order to appropriately setup a sonde to communicate measurements to a datalogger, it is critical to align the settings from the sonde and the logger.

In the KorEXO software | **Deployment Settings** | choose the parameters and sort order, then push the template to the sonde. (Kor Version 1.0 shown on the top-right, and KorEXO version 2.0 shown above on the bottom-right.)

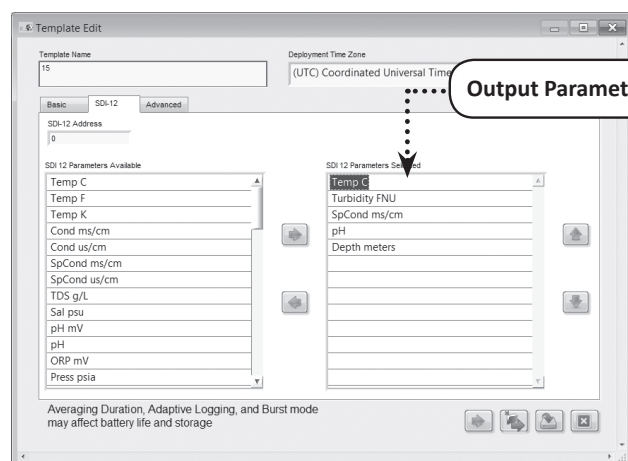
In both versions the complete list of parameters is shown in the left column and the selected parameters to output via the DCP 2.0 adapter are shown on the right. This template can be saved locally on the PC, but it must also be pushed down to the sonde for the settings to take effect. So be sure to apply the template to the sonde.

**Note:** there are two options when applying the template to the sonde, apply without logging or with logging. Either option may be used. When deploying with logging the sonde will create a redundant log file inside the sonde. Without logging the only data will be available to the RS-232 or SDI-12 outputs.

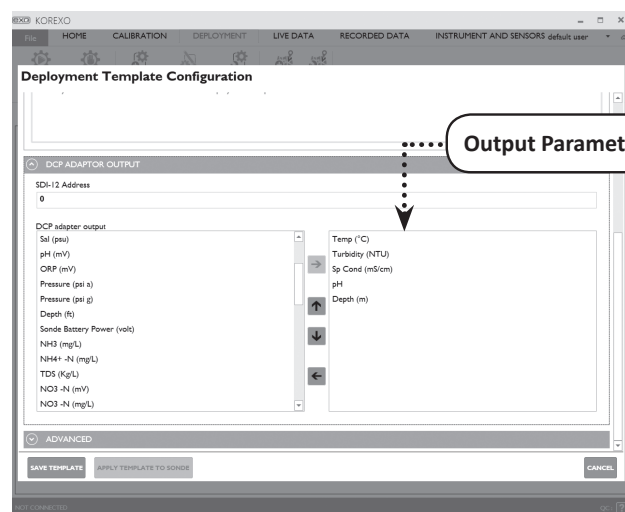


For access to the beta software, or assistance changing the default settings, please contact Technical Support at [info@ysi.com](mailto:info@ysi.com).

(**Note:** KorEXO software still in development, screen will change in final release.)



Kor Version 1.0



KorEXO Version 2.0.x



## > EXO DCP Signal Output Adapter Programming Basics

### 1. SDI-12 Interface

#### • General

- Compatible with v1.3 of SDI-12 specification
- Supports following standard commands:
  - 'I' Address Query
  - 'A' Change Address
  - 'C' Concurrent Measurement
  - 'D' Data
  - 'I' Identification
  - 'M' Start Measurement
  - 'V' Start Verification

#### • Extended Commands

- SDI-12 'Z' command
- Supports the following RS232 commands:
  - 'sn' Serial Number
  - 'para' Parameter List
  - 'twipeb' Start wipe
  - 'ver' S/W version
  - 'ssn' Sensor Serial Numbers

### 2. RS-232 Interface

#### • General

- Command Line
- '#' is user prompt
- Commands are not case sensitive
- Only spaces are recognized as delimiters
- A command is terminated by a <CR><LF>
- Minimum time from power up to valid readings is 19 seconds

#### • Command List

See RS-232 commands on page 6.  
See Port Settings on page 7.

**An example of a NEMA enclosure where the DCP Signal Output Adapter is wired.**



[ ] indicates argument is optional      <i> indicates argument is an integer

## data

Returns one line of data readings. Data parameters specified in para command. Data delimiter is specified in the setdelim command.

## dowait [<i>]

Turns “wait for DO” on if <i>=1 and off if <i>=0. The response is “OK”. If you do not supply <i>, then the response is the current value of dowait. When enabled the SOA/DCP will not return data until sonde has been on for “dowarmup” seconds.

## dowarmup [<i>]

Sets DO sensor warmup time where <i>=warmup time in seconds. The response is “OK”. If you do not supply <i>, then the response is the current value for dowarmup. When “dowait” is enabled the SOA/DCP will not return data until sonde has been on for “dowarmup” seconds.

## fltreset

Resets all sonde sensor filters. The response is “OK”.

## hwipesleft

Returns a value other than 0 if a wiper event is in progress. The value returned is normally the amount of “half” wipes that are left to go. When wiping is completely finished, the value will go to 0.

## para

Returns the parameter numbers of all parameters selected for output. Each number returned matches one for one with the values returned in the data command. The numbers are space delimited. Refer to section 3 for list of parameter codes.

## para [<i1> <i2> <i3> <i4> ...]

Sets the data parameter codes used with the data and run commands. The parameters are space delimited. Refer to section 4 for the list of parameter codes. If you do not supply any parameters then the response is the current list of parameters. Maximum number of parameters is 32.

## pwrptorun [<i>]

Turns “power up to run” on if <i>=1 and off if <i>=0. The response is “OK”. If you do not supply <i>, then the response is the current value of pwrptorun.

## run

Causes the sonde to SOA/DCP to take sonde readings at a 1Hz rate. The output is similar to the Data command except that readings are taken continuously. No headers are output. To abort send ‘0’, <esc>, or turn power off to the SOA/DCP and then reapply.

## setcomm [<i1>] [<i2>]

Changes the SOA/DCP’s comm port baud rate and data length. The baud rate will be immediately changed after this command, so you will need to reconfigure your terminal to match.

### <i1> can be:

2 - 1200 baud	6 - 19200 baud
3 - 2400 baud	7 - 38400 baud
4 - 4800 baud	8 - 57600 baud
5 - 9600 baud	9 - 115200 baud

### <i2> can be:

0 - 7 bits
1 - 8 bits

RS-232 Command List Continued on next page.

## ➤ RS-232 Command List, Continued

### **setdelim [<i>]**

Changes the SOA/DCP's delimiter used in the data command response. If you do not supply <i>, then the response is the current value for delimiter.

<i> can be: 0 = space, 1 = TAB, 2 = comma, 3 = none

### **setecho [<i>]**

Enables (<i>=1) or disables (<i>=0) command echoes. When echoes are disabled, commands sent to the SOA/DCP will not be 'echoed' back and there will be no '#' prompt. If you do not supply <i>, then the response is the current value for echo.

### **setmode [<i>]**

Sets the RS232 mode. If <i>=0, mode is normal. If <i>=1 mode is NMEA. If you do not supply <i>, then the response is the current value for mode.

### **setradix [<i>]**

Sets the radix point used for data output. If <i>=0 radix will be '.'. If <i>=1 radix will be ','. Note that in SDI12 mode, the response to a 'D' command will always be with '.' regardless of this setting. The response is "OK". If you do not supply <i>, then the response is the current value for radix.

### **setsonde [<i>]**

Selects a sonde for RS232 communications when more than 1 sonde are daisy-chained. <i> represents the order of the sonde in the chain where 1st sonde = 0, 2nd = 1, 3rd = 2. The response is "OK". If you do not supply <i>, then the response is the current value for sonde.

### **sn**

Returns the unique serial number programmed into every YSI sonde.

### **ssn**

Returns the unique serial number for the sonde and all attached sensors

### **setperiod [<i>]**

Sets the period for the data output in RUN mode. The period is set to <i> milliseconds. Minimum value is 250 (1/4 second), maximum value is 30000 (30 seconds). If you do not supply <i>, then the response is the current value for period. For periods less than 1000 and baud rates below 9600, the data output may be unreliable.

### **time [<hh:mm:ss>]**

Allows user to set time in the sonde in the HH:MM:SS format. The response is "OK". If you do not supply <hh:mm:ss>, then the response is the current value of time.

### **twipeb**

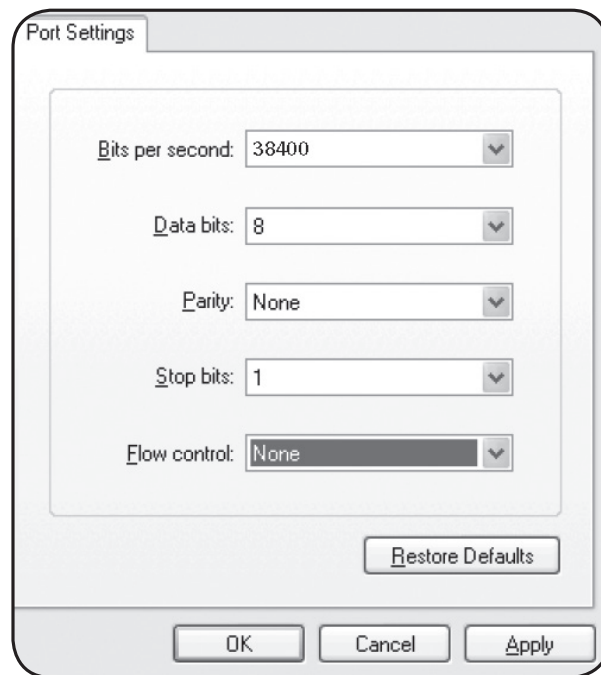
Starts a wiper event. The response is the approximate time in seconds it will take to perform the wipe.

### **ver**

Returns the software version number of the sonde.

### **verdate**

Returns the time and date at which the current version of software in the sonde was compiled.



**RS-232 settings should resemble this image.**

## ➤ Available Parameter Codes

For reference, below are the available parameter codes:

- All codes below 223 are 6-series compatible (except TSS).
- Maximum of 23 codes in sonde parameter list.

Parameter	Code
Temperature, °C	1
Temperature, °F	2
Temperature, °K	3
Conductivity, mS/cm	4
Conductivity, uS/cm	5
Specific Conductance, mS/cm	6
Specific Conductance, uS/cm	7
TDS, g/L	10
Salinity, PPT	12
pH, mV	17
pH	18
ORP, mV	19
Pressure, psia	20
Pressure, psig	21
Depth, m	22
Depth, ft	23
Battery, V	28
Turbidity, NTU	37
NH3 (Ammonia), mg/L	47
NH4 (Ammonium), mg/L	48

Parameter	Code
Date, DDMMYY	51
Date, MMDDYY	52
Date, YYMMDD,	53
Time, HHMMSS	54
TDS, kg/L	95
NO3 (Nitrate), mV	101
NO3 (Nitrate), mg/L	106
NH4 (Ammonium), mV	108
TDS, mg/L	110
Chloride, mg/L	112
Chloride, mV	145
TSS, mg/L	190
TSS, g/L	191
Chlorophyll, ug/L	193
Chlorophyll, RFU	194
ODO, %Sat	211
ODO, mg/L	212
ODO, %Sat Local	214
BGA-PC, RFU	216
BGA-PE, RFU	218

Parameter	Code
Turbidity, FNU	223
Turbidity, Raw	224
BGA-PC, ug/L	225
BGA-PE, ug/L	226
fDOM, RFU	227
fDOM, QSU	228
Wiper Position, V	229
External Power, V	230
BGA-PC, Raw	231
BGA-PE, Raw	232
fDOM, Raw	233
Chlorophyll, Raw	234
Potassium, mV †	235
Potassium, mg/L †	236
NLF Conductivity, mS/cm	237
NLF Conductivity, uS/cm	238
Wiper Peak Current, mA	239
Vertical Position, m	240
Vertical Position, ft	241

† **Note:** Potassium is considered future functionality, there is currently no EXO probe for Potassium (as of 2015).